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CONVERTER APPLIANCE CAPACITOR ASSEMBLY

~~Capacitor assembly for a converter appliance~~

Description

Sub A1

The invention relates to a capacitor assembly for a converter appliance having a capacitor which can be attached by means of side mechanical holders to a base frame or a heat sink.

A capacitor assembly for a converter appliance has been proposed in German patent application P 198 13 365.0, in which a central, metallic multifunction housing part, which is connected directly to the heat sink of the power semiconductors, is connected to the capacitors such that it makes thermal contact. The driver circuits for the power semiconductors and the control and regulating arrangement of the converter appliance are located above the capacitors. These components are connected to the multifunction housing part via attachment devices required for this purpose. The multifunction housing part can be designed with or without a power busbar system.

Sub A2

Sub A3

The invention is based on the object of specifying a capacitor assembly for a converter appliance, which allows the converter appliance to have an extremely compact design.

This object is achieved by a capacitor assembly for a converter appliance having a capacitor which can be attached by means of side mechanical holders to a base frame or a heat sink and which has an additional front mechanical holder for attachment of at least one electrical connection of the converter appliance and of at least one measurement sensor, in particular of a current transformer and/or voltage transformer.

The advantages which can be achieved by the invention are, in particular, that the proposed capacitor assembly makes it possible to design a converter appliance such that space is saved, the weight is reduced and costs are reduced. Since the capacitor assembly is itself designed as the load-bearing and central component of the converter appliance, there is no need whatsoever for the mechanical supporting and auxiliary frames which are normally generally used for converter appliances. A further advantage is that the capacitor assembly can be disassembled for recycling.

One advantageous refinement of the invention comprises at least one electronic circuit - preferably a drive circuit for power semiconductors - being attached to the mechanical holder. This embodiment assists the idea of the invention of allowing the capacitor assembly to be designed simply and as compactly as possible.

A further feature of the invention has the same aim, and comprises the mechanical holder being provided at the front with respect to the capacitor.

One modification of this embodiment according to the invention is for the mechanical holder to be arranged at the side on the capacitor.

Depending on the spatial requirements, it may in this case be advantageous for a number of individual holders to be provided at the side on the capacitor. This means that the capacitor assembly according to the invention can be used for a large number of spatial requirements.

The invention will be explained in more detail in the following text with reference to the exemplary embodiments which are illustrated in the drawing, in which:

Figure 1 shows a perspective view of a capacitor assembly according to the invention;

Figure 2 shows a view of the front face of a converter appliance fitted with the capacitor assembly according to the invention;

Figure 3 shows a view of a side surface of a converter appliance fitted with the capacitor assembly according to the invention, and

Figure 4 shows a perspective view of a further embodiment of the capacitor assembly according to the invention.

Figure 1 shows a perspective view of a capacitor assembly. A cubic or cuboid capacitor 1 can be seen, which is connected to side mechanical holders 2, 3 on two opposite side surfaces. The capacitor may be integral, but it is also possible to combine a number of individual capacitors of smaller capacitance to form the capacitor with the desired capacitance. The two side mechanical holders 2, 3 are used for mounting the capacitor assembly on the base frame 4, for example on a heat sink (see item 12 in Figures 2 and 3). The capacitor 1 has a further, front mechanical holder 5, which extends on a face - from now on referred to as the front face - located between the mechanical holders 2, 3.

The front mechanical holder 5 of the capacitor assembly is used for attachment of electrical connections 6 (AC voltage connections, DC voltage connections) of the converter appliance and for attachment of measurement sensors, in particular of three current transformers 7 and one voltage transformer 8. Furthermore, a number of electronic circuits 9 are attached to the front mechanical holder 5. These electronic circuits 9 are

drive circuits for the power semiconductors of the converter appliance.

A further, flat electronic circuit 10 is attached to the top face of the capacitor assembly or of the capacitor 1, this being the control and regulating device for driving the power semiconductors.

Figure 2 shows a view of the front face of a converter appliance fitted with the capacitor assembly. This shows that the capacitor 1 is mounted via the two side mechanical holders 2, 3 on a heat sink 12 to which a large number of power semiconductors 11, which are arranged side by side, are fitted. In the exemplary embodiment, this is a heat sink 12 which is fitted with cooling plates 13 and is suitable for air cooling. Liquid heat sinks can, of course, also be used.

The electrical connections 6 and current transformers 7 mounted on the front mechanical holder 5 are freely accessible on their top face in order to make contact with external power connections (electrical power supply, load connections), normally cable connections, and, on their bottom face, make contact with connections of a busbar system 14 within the appliance. The busbar system 14 provides the electrical connections for the individual power semiconductors 11 and, via a capacitor connection 15 (see Figure 3) at the rear, the electrical connections for the capacitor 1.

Figure 3 shows a view of a side surface of a converter appliance fitted with the capacitor assembly. This shows the heat sink 12 with cooling plates 13, the power semiconductors 11 mounted in two rows on the heat sink 12, the capacitor 11 connected to the heat sink 12 via the side mechanical holders 2, 3, the front mechanical holder 5 with a current transformer 7

attached to it, the busbar system 14 and the rear capacitor connection 15. The side mechanical holder 3 has been removed in order to make it possible to see into the converter appliance.

Figure 4 shows an embodiment of the capacitor assembly according to the invention, modified from that in Figures 1 to 3. In this case, two individual holders 5' are provided instead of the integral front holder 5 as shown in Figures 1 to 3. These are also used for accommodating the electrical connections 6 of measurement sensors, such as current transformers 7, and a voltage transformer. Furthermore, there are electronic circuits 9 in the region of these individual holders 5'.

List of reference symbols

1 Capacitor
2 Side mechanical holder
3 Side mechanical holder
4 Base frame
5 Front mechanical holder
6 Electrical connection
7 Current transformer
8 Voltage transformer
9 Electronic circuit (drive circuit for power semiconductors)
10 Electronic circuit (control and regulating device)
11 Power semiconductor
12 Heat sink
13 Cooling plates
14 Busbar system
15 Capacitor connection